Distance-Income Migration Trade-Off of Young French Workers : An Analysis per Education Level.

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Distance-Income Migration Trade-Off of Young French Workers : An Analysis per Education Level.

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Abstract:

Most research studies on migration see the latter as a move from one geographic area to another. Taking into account distance in our analysis of young French workers' migration from one local labour market to another, enables us to evaluate more precisely the migration decision, viewed as a cost-benefit trade-off based on the distance travelled and some territorial characteristics. We find that the wage returns to migration are nil for the most highly-skilled ones, leading us to consider that these workers conduct their job search on a national scale. In contrast, the less-skilled workers get a positive return to migration.

Key words: local labour markets, spatial mobility, migration wage return, self-selection bias, distance, labour-market entry

Résumé:

La plupart des études sur la migration s'intéresse au changement d'espaces géographiques. La prise en compte conjointe de la distance dans le changement de marché local de travail de jeunes travailleurs français, nous permet ici d'évaluer plus précisément la décision de migration, considérée comme un arbitrage coûts-avantages fondé sur la distance parcourue et des caractéristiques territoriales. Nous observons alors que les avantages salariaux liés à la migration sont nuls pour les plus qualifiés, ce qui nous conduit à considérer que ces travailleurs réalisent leur prospection d'emploi à l'échelle nationale. Tandis que les travailleurs les moins qualifiés obiennent un rendement positif de la migration.

Mots clés: marché local du travail, mobilité spatiale, rendement salarial de la migration, biais de sélection, distance, insertion professionnelle

1. Introduction

Most people are aware of the advantages of migrating. They are conscious of the positive impact it may have on their professional career and/or personal life (better environment, increased earnings, better work conditions…). However there are many factors that can reduce the attraction of migration. Economists generally approach the question of the decision to migrate on the basis of a cost-benefit trade-off model. But, considering the fact that this decision is usually evaluated on the basis of a change of geographical areas, it is relevant to mention the model proposed by SJAASTAD in 1962. He considered a migration decision, above all, as the choice of a distance to travel, and thus he evaluated it as an "income-distance trade-off" since distance was considered as a proxy of the migration costs.

Nevertheless, since the founding works of Sjaastad, the use of distance in microeconomic models of migration decision has been relatively limited, although most aggregate models for analysing migration flows use distance (GREENWOOD, 1997). One reason for this is related to accessibility to this data. Gravity models deal with the relations between geographic areas, and in this case, it is the distance between the centroids of the areas of departure and of arrival that is measured. However, in microeconomic models it seems dubious to associate an individual's migration with an approximation of distance between relatively large areas. It would be more appropriate to measure the distance travelled by individuals when they relocate. Yet, these data are rarely available. In their absence, some authors attempt to distinguish migration between neighbouring areas or within one area from migration between areas that are far apart. Since we have, in our sample, the geographic coordinates of the towns in the areas of departure and arrival, we propose to make use of the actual geographic distance in order to evaluate its impact on the migration process, in the income-distance trade-off

framework, and for a particular category: young workers, the most mobile group of the total population (LONG, 1988).

However, our aim here is not so much to use distance in isolation but rather to jointly consider the distance travelled and the migration between local labour markets. Indeed, we make the hypothesis that the decision to migrate and the decision to travel a given distance are interrelated. Models that evaluate returns to migration – and see the latter as no more than a move from one territory to another - make the implicit hypothesis that the costs of migration are uniform, regardless of the distance travelled. These models generally estimate returns to migration by calculating an average migration cost on the basis of a change of territory alone (i.e. without considering the distance travelled). On the contrary, the previous discussion suggests that the choice to relocate from one territory to another is simultaneously linked to the choice of a distance. In other words, the decision to migrate and the choice of a specific distance to cover are two intrinsically interrelated elements that are difficult to separate from each other. This is the reason why we propose to integrate distance into our migration variable. By doing so we aim to account for migration costs, and we then propose a new point of view on the microeconomic study of spatial mobility.

We also wish to be more specific about an important hypothesis, which is that migration behaviour varies with education levels. The interactions between the returns to education and the amplitude of migration have recently been examined (using French data that are comparable to the data exploited here) by associating the distance travelled and the number of years of study (LEMISTRE and MOREAU, 2009). The essential result is that the returns to initial education are quite clearly influenced by migration. Nevertheless, the education level in this study is represented by a unique continuous variable: this rests on the hypothesis that young people with different education levels make their decisions in the same way - relatively to the other variables of the model. For this reason, we intend to divide the sample into groups of

different education levels to highlight, on the one hand, the different returns to migration, and on the other, the various effects of individuals' and territories' characteristics on migration decision. A first attempt along these lines has already been made using French data (see DÉTANG-DESSENDRE et al. (2004)), but the education levels selected were fewer, the geographic areas considered were larger (the French *départements*) and the territorial characteristics were not considered. The authors of this study concluded that for the least qualified workers, migration had no impact on wages. We demonstrate here that taking into account the distance travelled and using smaller geographic areas invalidates this result. Moreover, we show that the territories' characteristics can also have strong effects.

For this purpose we use the data from the French "Generation 98 Survey", which enables us to observe the spatial mobility of young people during the first three years of their working life. Internal migrations within the French territory are considered on the basis of a spatial division of the national territory into areas that reflect local labour markets. The French local labour markets involved are called "*Zones d'Emploi*", translated here as "Employment Zones" and abbreviated EZ. They are the equivalent of the "Labour Market Areas" of the United-States, the "Travel to Work Areas" of the United Kingdom, or the "Local Labour System" of Italy. Each EZ is defined as a geographic space in which inhabitants usually find work and in which local business units find the labour needed to fill the vacancies they provide[i]. We then observe that almost half of the young workers find employment in zones different from those in which they finished their studies. And by considering the distance travelled by migrants between EZs, we find that the less-skilled workers sometimes migrate long distances away, even though fewer of them do move.

This article is organized as follows. In the first section, we reinvestigate the theoretical framework of the income-distance trade-off model. This is an important question to consider

when studying the role played by distance in a "spatialized" job-search model. Its empirical specification is the subject of section two. We explain how and why using the distance travelled makes it possible to better address the self-selection bias problem in migration studies; we then introduce our empirical specification. In the third section, we present data and some statistics on individuals' propensity to migrate, with the aim of describing migration behaviour using groups of education levels. We present our results in the following section and examine some observable determinants of migration by considering characteristics of individuals and territories. We also evaluate diverse returns to migration according to the identified determinants of the migration decision based on migration distance travelled, and controlling for the effects of unobservable characteristics (self-selection bias). To conclude, we outline some consequences of these results on public policy, and in particular that related to the government subsidies encouraging workers to find employment by moving.

1. The income-distance trade-off in migration decision: a review of the theoretical framework

1.1. Spatial Job-Search Process

The value a person attributes to each job offer v is a function of its individual characteristics X and those of the job in question Y (the employment variables should be understood in a broad sense, and often include geographic specificities). The introduction of space into the job-search model leads to taking into consideration that some individuals can access job offers in a labour market that is external to their market of origin. Even so, it is difficult to determine which individuals widen their field of search. Indeed, individuals whose search in their local area can still have access to job offers coming from outside their local market, through various information channels. Similarly, an individual who has accepted

employment in his home labour market may have explored other markets. From this perspective, the effect of the costs of the job search on the reserve job value remains indeterminate. For this reason, DÉTANG-DESSENDRE et al. (2004) consider an overall job offer distribution including the home market and the external labour markets taken together, and therefore, with one single reserve job value, regardless of the spatial job-search strategy. This hypothesis therefore leads us to consider a general distribution of job offers that includes external labour markets as well as the home market, with a single employment reserve value V_g*, whatever the spatial job-search strategy used.

The effect of the costs of job searching remains indeterminate. However, when only based on the job reserve value, the costs of migration play a determinant role because they clearly govern the decision to migrate. Indeed, in the human capital theory, it is above all the trade-off between these costs and the income benefits associated with the relocation that determines the decision to migrate or not (SJAASTAD, 1962). The distance travelled is then partly related to the cost of migration, and migration occurs if and only if the gain in terms of income exceeds this cost (FALARIS, 1988, NAKOSTEEN et al., 2008). Let us denote m_i* the individual latent propensity to migrate. An individual will migrate ($m_i*>0$) only if he can recover the costs of migration. From previous considerations, we assume that he accepts the offer of employment $v_{gi}*$ (originating from the global distribution) only if it exceeds his reserve employment value and exceeds his migration costs c_i :

$$m_i*>0 \quad \text{if} \quad v_{gi}*>V_{gi}*+c_i \quad (0)$$

The surplus utility v_i* that is derived from migration alone is written:

$$v_i*=v_{gi}*-V_{gi}* \qquad \text{and} \qquad v_i*=c_i+s_i \qquad \text{with} \qquad s_i>0 \quad (1)$$

That is, the individual migrates only if he obtains a net benefit s_i.[ii]

If it is supposed that the total supplemental utility can be expressed entirely in terms of salary *ceteris paribus*, the employment reserve salary w_i* associated with the overall value

of the job, with characteristics *Y*, anticipated by an individual with characteristics *X*, may then be written as:

$$w^*_i = W(X_i, Y_i, v_i^*) \quad (2)$$

The migration costs are associated with certain individual variables x_i, which may not explain the salary (some, but not all, x are in common with X_i). The costs are also associated with certain geographic variables z_i, which may be characteristics of the zone of departure that induce the individual to migrate (high local unemployment rate, few qualified jobs, few amenities, etc.) or differences between certain characteristics of the desired and original zones (NAKOSTEEN and ZIMMER, 1980). These are what are called push and pull effects (GREENWOOD, 1997).

For net surplus s_i , many arguments justify this dependence on individual x_i and geographic z_i variables. For instance, Gibbs (1994) showed that employees from rural areas are less demanding than those from urban areas. As for the individual variables, the participation of women in the labour market cannot be explained in the same way as that of men. This dissimilarity can cause differences in remuneration, which affects the profitability of migration (KEITH and MCWILLIAMS 1999).

Then the surplus utility ($v_i^* = c_i + s_i$) may be written as :

$$v_i^* = \beta_0 + \beta_1 y_i + \beta_2 x_i + \phi_i \quad (3)$$

And the associated job reservation wage as:

$$w_i^* = \delta_0 + \delta_1 X_i + \delta_2 Y_i + \delta_3 v_i^* + \varepsilon_i \quad (4)$$

1.2 An Income-Distance Trade-Off Empirical Model

Neither the overall job value, the reservation wage, nor the surplus utility related to migration are observable. Only the ex-post salary w_i is observed. This model is usually

estimated using, as a proxy for the utility of migration, a latent variable estimated *via* the change of territory alone (RAPHAËL and RIKER, 1999; GABRIEL and SCHMITZ, 1995; FALARIS, 1988; NAKOSTEEN et al., 2008). An important limitation of these estimates is that they only take into account an average effect of migration with two unique states – migrants *versus* non-migrants:

$$\begin{array}{ll} m_i = 1 & if \quad m_i^* > 0 \\ m_i = 0 & if \quad m_i^* \leq 0 \end{array} \qquad (5a)$$

where m_i is the observed migration variable of a change in territory, assuming that its effect is similar regardless of the amplitude of migration. In other words, a migrant covering 20 km and another covering 1,000 km would be seen as identical.

Many research studies have tried to circumvent this difficulty by evaluating the impact of migration and its determinants between different zones of mobility and by limiting the frontier effects. Having data on the actual distances travelled enables us to specify the model by taking into account the fact that decision to migrate and the distance travelled when migrating are intrinsically interrelated. Therefore we propose to estimate another observed migration variable m_i' expressed by the distance travelled d_i considered as a proxy for the total surplus v_i, keeping in mind that it will not be possible to disassociate its two components: migration costs and net surplus.

$$\begin{array}{lll} m_i' = d_i \ with \ d_i > 0 & if & m_i^* > 0 \\ m_i' = 0 & if & m_i^* \leq 0 \end{array} \qquad (5b)$$

To simplify, we write the empirical model as follows :

$$\begin{array}{ll} d_i > 0 & if \quad m_i^* > 0 \\ d_i = 0 & if \quad m_i^* \leq 0 \end{array} \qquad (5c)$$

As distance remains closely related to migration costs and as the marginal cost is assumed to be decreasing, we suppose that the marginal returns to migration decrease with distance: $\frac{\partial w(d)}{\partial d} > 0$ and $\frac{\partial w(d)}{\partial d} < 0$. Such results have been confirmed by DA VANZO (1983) and

FALARIS (1988) who recommended using the logarithm of the distance. As the log of zero does not exist, the non-migrants are assumed to have moved a minimal distance of 1 km. Therefore, the model to be estimated is derived from equations *(3)* and *(5c)* becomes:

$$\ln d_i = \beta_0 + \beta_1 x_i + \beta_2 z_i + \phi_i \qquad (6)$$

and the earnings function from equation (*4*) is :

$$\ln w_i = \delta_0 + \delta_1 X_i + \delta_2 Y_i + \delta_3 \ln d_i + \varepsilon_i \qquad (7)$$

where the wage is usually expressed in log form, particularly because this specification allows for a direct reading of the returns.

1. Empirical Specification and Data

2.1 Specification and migrants' selection bias

The decision to relocate and to migrate a given distance is made if the utility of this decision is positive, that is to say if there exists a linear combination threshold of x_i and z_i beyond which the decision to migrate dominates the decision to remain sedentary: let us call $k_i\gamma$ that linear combination. This decision rule is not deterministic and we attempt to jointly estimate the probability of relocating and of migrating a given distance. We only observe the distance travelled by individual migrants. Then we propose to use a censored Tobit model adapted to the truncated nature of the migration variable d_i. A migration is actually seen as the distance travelled when changing territories ($d_i > 1$ or $\ln d_i > 0$) and the censoring point corresponds to sedentary individuals ($d_i = 1$ or $\ln d_i = 0$). The log-likelihood of this Tobit model is:

$$\ln L(k,\gamma,\sigma_\theta) = \sum_{i:d_i=1} \ln\left[1-\Phi(\frac{k_i\gamma}{\sigma_\phi})\right] - \frac{N_1}{2}\ln(2\pi\sigma_\phi \quad -\frac{1}{2\sigma_\phi}\sum_{i:d_i>1}(\ln d_i - k_i\gamma) \qquad (8)$$

with N_1 designating the number of observations for which $\ln d_i > 0$. So as to ensure that the function in the optimization process is concave, a numerical optimization procedure is used, through the reformulation of the log-likelihood function according to OLSEN's method (1978).

The estimated earnings function is equation *(7)* in which it is appropriate to deal with the endogeneity bias of the variable $\ln d_i$. This endogeneity bias results in a correlation between the error terms of the Tobit estimation of the distance ϕ (equation *6* estimated via equation *8*) and the ones in the estimation of the earnings function ε (MADDALA, 1983). Here, the correlation signifies that the individual non-observed variables in k_i are correlated with the non-observed variables in X_i. In their model, DÉTANG-DESSENDRE et al. (2004) actually do point out that wage returns to migration may be biased because of these unobservable factors influencing both wages and migration decision. The consequence of this is the emergence of an self-selection effect (NAKOSTEEN and ZIMMER, 2008; YANKOW, 2003). Migrants may in fact be characterized by some favourable unobservable intrinsic factors (not represented among the *X*) that facilitate the migration decision, such as greater motivation or a higher ability to process information, risk aversion, etc.. And these qualities could also positively influence wages, and thus create positive self-selection for the migrants, compared to similar people who do not migrate, when based on observable characteristics. On the other hand, it is possible to imagine that the migrants might be characterized by unobservable negative intrinsic factors that reduce their wages, leading them to widen their search field to find a better job. Relative to observable factors, the self-selection of the migrants appears here to be negative in comparison to similar non-migrants.

Therefore, the question is to determine whether the wage returns to migration are the consequence of unobservable characteristics or whether they are due to the migration process

alone (the migration cost-benefit trade-off). Indeed, if a migrant benefits from a wage surplus, it may be either linked to unobservable favourable quality effects, or it might simply be justified by compensation for migration costs or finally, it may be explained by both these reasons at once. However, these two effects may be opposed. In this case, the average return may be nil and/or statistically insignificant (KRIEG, 1997; FALARIS, 1988), while in reality there is a negative effect of unobservable characteristics and a positive effect of migration costs. Migration costs can therefore explain the diversity of findings in the empirical literature on migration. We argue that taking into account distance as a proxy for migration costs enables us to distinguish much more clearly between wage variations due to the unobservable characteristics and wage differences that are part of returns to migration[iii]. It therefore seems important to us to jointly reconsider the estimates of the selection bias and the returns to mobility in our sample by integrating a variable that is more representative of the decision to migrate: the migration distance.

When the correlation between the error terms of the Tobit estimation and the error terms of the estimation of the salary equation is negative, the geographically mobile workers have unobserved characteristics that have a negative effect on salary. They may not, for example, be the "best" *ceteris paribus* (X_i and Y_i). In this case, the return to the endogenous distance is superior to the return estimated by OLS, which captures the negative effect of the "unobservable" variables. In this way, we obtain the effects that stem specifically from migration. The treatment of this endogeneity bias is controlled for using NELSON and OLSEN's method (1978). To do this, we apply the principle of instrumental-variable estimation. Let us remember that because of the specificity of the Tobit model (used to estimate the migration equation), the instrumental-variable procedure does not directly correspond to the two-stage least squares (2SLS), which applies to continuous quantitative variables, but to the method

proposed by NELSON and OLSEN. According to the terminology given in MADDALA (1983), this instrumentation technique based on the Tobit model is noted as T2SLS. As a result of this instrumentation, we obtain the effect that is specific to migration, independently from the unobservables in the earnings function.[iv]

2.2 Sample Selection and Descriptive Statistics

We have exploited data from the *Céreq*'s[v] "Generation 98" survey in which 55,000 youths who left the French education system with an initial education in 1998 are observed over a three-year period. They are representative of the whole generation of individuals leaving school (700,000). The spatial mobility of young people is seen as a move away from their local labour market (the "Employment Zone", abbreviated "EZ"), occurring between the end of their studies in 1998 and their being employed in 2001, three years after leaving the French education system. This sample is composed of 44,327 young men and women who were employed in 2001. The location of the job is more determining in the migration effort than the location of previous residence. Therefore, we have opted to observe the migration in relation to the place of employment in 2001.[vi]

As mentioned earlier, the level of education strongly influences both migration and earnings. So we have performed several estimates, per education level. In a first stage, the estimations were carried out for each of the seven levels. Then, the first three and the following three were grouped because the results were adjacent insofar as the determinants of migration were concerned as well as for its impact on salary. Findings are therefore presented for three levels: i) young people with no qualifications or with a diploma equal to or below the French *Baccalauréat* (denoted "Bac" [vii]) ; ii) the Bac graduates that studied a further 2 years ("Bac +2") or a further 4 years ("Bac+4") since their Bachelor's degree; iii) the ones that

studied a further 5 years ("Bac +5" which corresponds to a Master degree) or more (to obtain a PhD for instance) since their Bachelor's degree.

We observe that the number of employment related relocations greatly increases when we use a partition into EZ rather than into regions, which are more frequently used in studies on the subject. While relocations from EZs to Ezs concern more than half of the higher (EZ moves: 65% *vs.* regional moves: 38%) and intermediate levels (54% as opposed to 24%), 36% of the lower-skilled workers also moved from the EZ in which they had studied. When approaching migration using a regional scale, the mobility of the least qualified individuals is much lower. When we use the EZ scale, the propensity to migrate of the low-skilled workers can no longer go overlooked. The Euclidean distance[viii] reveals some remarkable differences in mobility behaviour. In particular, including distance means that previous results must be evaluated by comparing them to one another, because relocations between EZs can correspond to different distances travelled, and consequently to different migration efforts. For instance, one individual may be considered as a migrant even though he has only crossed a border, unlike another who may have travelled a distance ten times as great. These differences are obvious in this reduced spatial scale as shown in Table 1.

TABLE (1) HERE

Indeed 42% of the relocations from one Employment zone to another are associated with distances of over 100 km, that is twice the distance travelled in the case of migration between regions. As a result, the variability of the distances travelled when we consider migration from EZ to EZ is greater than if we consider migration between regions. Thus, the smaller the spatial scale, the more important it is to take into account this criterion, because the diversity of mobility behaviours is greater.[ix]

Finally, it is important to note that among the migrants, the lesser-skilled workers also migrate over great distances. For instance, the proportion of migrants covering over 300 km

is almost the same for both average- and low-skilled workers, whether we consider migration from EZ to EZ or migration from region to region. Thus, including the actual distances travelled in the analysis enables us to re-assess some widely-held views, such as the unwillingness of low-skilled workers to migrate. Nevertheless, we observe that only 3% of the relocations between regions involve distances of less than 20 km, unlike the percentage rises to more than 20% for migrations between EZs. Thus, since travelling distances of less than 20km is much more likely to be considered as commuting rather than migrating, we shall not count those moves as migration[x].

3. Results

3.1. The Determinants of the Decision to Migrate

In a first step, we examine the different effects of the individual and territorial determinants of the choice to relocate between EZs and to travel over a given distance, according to the education level of the individuals (Table 2).

TABLE (2) HERE

With regard to individual-related determinants, the results and the variables used are identical to those of many other studies and will therefore not be commented[xi]. These individual variables are the ones that are commonly used in studies on this subject and using this kind of sample, particularly in French studies (see Détang and al. 2004). Those variables are also discussed in the review of the literature by Greenwood (1997). Territorial characteristics can also influence the decision to migrate. First, young people from predominantly rural areas are more prone to mobility. The low demographic density associated with this type of area reduces the probability of finding employment and increases

de facto the probability of leaving. Three main territorial characteristics of the Employment Zones were constructed from the data generated by the INSEE's[xii] General Population Census (1999): the demographic density, the unemployment rate and the level of education. Like NAKOSTEEN and ZIMMER (1980), we took into consideration the differences between the EZs of arrival and the Ezs of departure, so as to take into account that fact that the actor's decision-making process was founded on a comparison between territories (Table 3, T2SLS-2).

Since the population density also reflects the job offers in the local labour market, it is not surprising that in the case of job-related relocations, the migrants mostly move to zones with high population densities, which *a priori* offer more employment or re-employment opportunities. This finding is reinforced by the observation that young workers are less inclined to migrate to EZs whose unemployment rates are higher than those of the zone they come from.

Finally, since this analysis is performed per education level, it seemed interesting to integrate a characteristic reflecting the territorial level of human capital: we chose the proportion of the population over 15 years of age currently studying. The correlation with this indicator turns out to be positive for youth with education levels lower than the Bac, and unattractive for young people with an education level above the Bac. For the latter, this finding may be fairly surprising, but it can be explained by the fact that many of these young people were trained in an EZ whose youth study ratio was among the highest (particularly in the Paris area), and seemingly, the concentration of training tracks above the Bac exceeds the offer of employment corresponding to the EZ and leads them to migrate. Consequently, the divergence of this indicator between the EZ of arrival and departure being generally negative, the observed relation is negative for the superior education levels.

The individual trade-off leading to these relocations remain to be elucidated. The determinant examined here is the existence of a possible salary gain - supposedly reflecting the trade-off between the costs and benefits of migrations - analysed by means of these observable determinants.

3.2 Wage Returns to Spatial Mobility

The characterization of the wage equation corresponds to the determinants usually selected (*equation 7*) in the literature on the subject. And to evaluate the influence of migration in this wage equation, we estimate three wage equations.

The first one does not take into account the selection bias and only measures an average *ceteris paribus* effect of distance on wages. This model corresponds to the ordinary least squares (OLS) estimate of the coefficient of the migration variable in the earnings function.

Then, we estimate two earnings functions for which the selection bias (*equation 7* with *equation 6*) is taken into account according to two versions of the migration equation (*6*)[xiii]. The aim is to capture the various effects on wages of the different determinants of the distance travelled when migrating from an EZ to another. One version refers to the hypothesis that the determinants of mobility are above all linked to the individual's characteristics with respect to his initial situation: the migration equation only includes the individuals' characteristics T2SLS1 *(equation 6 vector x* - INDIVIDUAL'S CHARACTERISTICS *Table 2)*. The other version integrates the territorial characteristics in migration equation T2SLS2 (*equation 6 vector x and z* - INDIVIDUAL'S CHARACTERISTICS and TERRITORIAL CHARACTERISTICS *Table 2*).

Comparing the wage equation results generated by these two estimates will enable us, later on, to better understand the cost-benefit trade off mechanism at play in the decision to migrate. The results of these three wage equations for the whole sample and for the subgroups of education levels are presented in Table 3. Only coefficients of the distance

variable are shown in Table 3. For several distances, the wage returns calculated on the basis of these coefficients is also included in Table 3. Annex 1 summarizes the results of one estimation for all the variables[xiv].

TABLE (3) HERE

The OLS results for the various distances travelled when relocating seem to be in keeping with the common assumption, according to which the migration effort should be rewarded (positive yields), and all the more so when the distance travelled is great. Thus, as a function of the distance travelled, the lowest yield to migration appears to be 1.1% for the young workers with a Bac+5 education level who travelled 50 km; whereas, the individuals with intermediate education levels who travelled over 900 km obtained the highest yields of 6.3%. The highly trained individuals are those who benefit the least from the mobility effort. The fact that the relative cost of migration is lower for highly trained workers may explain this finding, although it might also be a reflection of the fact that the group must confront a national labour market. Along these lines, for these highly-trained individuals, geographic mobility is an expected consequence that does not require compensation for the costs attached to relocation. Nevertheless, this finding must be considered in relation to other results because we are dealing, here, with yields rather than absolute increases in earnings. The comparison of the absolute values for the different education levels might reveal a reversed trend.

As previously explained, unobserved factors exist that can both influence the decision to migrate and the salary, contributing to the endogeneity of the migration variable. This phenomenon is confirmed by endogeneity tests that are significant for all education levels, regardless of the migration equation employed. Part of these returns are therefore *a priori* erroneously attributed to the role of migration alone, which is why the earnings function was estimated by instrumenting the migration variable, as described previously. Two major results stand out from these instrumental estimates. Firstly, the effect of unobserved

characteristics varies according to the education level. Secondly, the different returns to relocations obtained using the two migration equations demonstrate the existence of a "territorial trade-off" within the cost-benefit trade-off in the migration decision.

Indeed, for young people with a Bac+5 education level, the coefficient of the migration distance is considerably overestimated since it becomes negative (seen by comparing the OLS and T2SLS1 columns). In other words, the remuneration obtained through the relocation only corresponds to the effect of unobserved characteristics. This result confirms the existence of a positive self-selection bias for the Bac+5 migrants. For the other education levels, on the contrary, the returns to relocation prove to be underestimated. Thus, even though these individuals suffer from unfavourable characteristics that probably compel them to broaden the spatial field of their job search, we can suppose that they would accept a job outside their home area only if it fully or partly compensates for the cost of relocation . The migrants with education level Bac+2, +3 or +4 obtain higher returns to relocation than those with a level below the Bac. These differences reflect not only variations in migration costs between these education levels, but also the small gap between the remunerations of workers with a low education level.

These rates of return are far from negligible. For individuals with a Bac+2, +3 or +4 level, relocating more than 600 km away generates a return that corresponds or exceeds that of an additional year of study. For young workers with an education level below the Bac, the returns to moving such distances are equivalent to the returns to two additional years of study.

The rates of return we have just interpreted were obtained with respect to *observable* factors explaining the migration variable: the determinants in the migration equation (i.e. the instruments) and marginal determinants in the earnings function. These yields refer to the trade-off between the costs and the benefits of migration. More precisely, a variable that reinforces migration reduces its returns because it makes the relocation less costly.

Conversely, a variable that inhibits the decision to migrate makes this decision more costly. Therefore the salary offered must be significantly higher if the individual is to decide to migrate. Consequently, the returns to migration vary according to the identifiable determinants, and so the cost-benefit trade-off of migration varies.

In a similar vein, the introduction of gap variables for territorial characteristics significantly modifies the returns to migration (T2SLS2 columns). Unquestionably, when they are introduced into the migration equation, the returns to all education levels change (compare the columns T2SLS1 and T2SLS2 in Table 3). More precisely, for individuals with an education level below the Bac and with a Bac+2, +3 or +4 level, the returns diminish; and people with a Bac+5 level, the negative returns approach nullity. These results can be explained by the migrants' internalization of the "comparative advantage" associated to the new territory, which partly compensates for migration costs, as it is revealed by the migration equation *with only individual's characteristics*, and therefore reduces the returns required for relocation when estimating the migration equation *T2SLS2*. In particular, the act of moving to a territory with a higher population density and a lower unemployment rate than the area of departure indicates that the probability of finding another job is higher in the event of a mismatched job found through migrating: the risk incurred by accepting a job in a distant location (for which the risk of evaluation error is greater) is therefore lower and *de facto* less remunerated. Such territorial characteristics probably also allow for professional advancement, and thus, partly compensate for the cost of relocating to a distant area. Hence, territorial characteristics contribute considerably to defining the distance-income trade-off in the migration decision.

Lastly, let us add that the returns to moves from one EZ to another alone have been evaluated for the purpose of comparison. Its estimation produces an average effect that is much higher than the effect evaluated with the migration distance. On the one hand, this

average effect overestimates the returns to relocating short distances away. On the other hand, it does not account for the decreasing marginal cost of migration, which reduces the returns to long distances. In other words, a dichotomous variable hardly reflects the diversity of migration costs, contrary to a distance variable. The double finding of the variability of the returns to migration as a function of the distance travelled and the unmasking of unobservable effects by using precise distances thus reinforces the choice of an estimation method based on the distance travelled for evaluating the returns to spatial mobility.

4. Conclusion

Geographic mobility is often considered to be an attribute of the most qualified workers. Yet, conducting an analysis at a sub-regional scale reveals that less qualified individuals can also be quite mobile. Moreover, taking into account the distance travelled when migrating allows for a considerably more accurate evaluation of the impact of geographic mobility on wages. It makes it possible to better understand the cost-benefit trade-off of the migration decision, while at the same time controlling for the effect of unobservable characteristics in the process of job-related migration of the whole set of young workers, including those with a low level of education.

Among the determinants of the cost of migration from an Employment Zone to another - captured by using the distance between the place of residence on completion of individuals' studies in 1998 and the place of employment in 2001 - are the education level of the individual, the education level of the wife or of the husband, the number of children, the social origin and characteristics of the territories, which have proven significant for all individuals − with non-negligible variations from one education level to another.

Concerning the returns to migration, the results of our investigation did not permit a total dissipation of the imprecision between the costs of the job search and the ones linked to the

relocation. But it actually turned out that the unobservable individual aptitudes - at least unobservable though the available variables - have either a positive or negative effect on the salary, according to the education level considered. The main finding is that this effect of unobservable characteristics varies among the individuals in the Bac+2, +3 or +4 education level group, while other research studies on migration showed that this effect was positive for the whole group. Thus, all else held constant, if the salary reflects the contribution to production, migrants are not necessarily the best workers, even for the education levels superior to the Bac. Nevertheless, these young workers receive a positive return to migration, and we can therefore think that those who migrate are not the "best" individuals but those of "average value" who are not able to exploit the local opportunities. This lower ability may have increased the opportunity costs of the relocation, and therefore driven these individuals to accept jobs with relatively lower salaries *ceteris paribus*, but which still compensate for the costs of migration.

In the end, the estimates per education level reveal clearly differentiated results, which lead us to assume the existence of different scales for the labour market according to education levels. The returns to migration for the most qualified individuals (in France, Bac+5 and higher) in fact only correspond to the remuneration of favourable unobservable qualities. We can therefore infer that these young workers are confronted with a national labour market, and that consequently they do not require to be compensated for the costs of their mobility, beyond the remuneration of their intrinsic qualities. Individuals with other education levels obtain, on the contrary, positive returns to migration in spite of the unfavourable effects of unobservable characteristics. The returns obtained are relatively high – for those with low education levels too. Unlike the most qualified individuals, these young workers are confronted with a multitude of local labour markets (the EZs), and the move from one to another necessitates that the migration costs be remunerated, taking into account the distance

travelled and the characteristics of the individual and his family. However, this wage surplus is more or less compensated by the "comparative advantage" associated with the territory of arrival in comparison with the territory of departure, which causes the returns to migration to vary according to the territorial characteristics.

We have made these findings by using a sub-regional scale more representative of local labour markets than the regional scale usually used, and by integrating the distances travelled, which remains a key concept in economic theories accounting for the role of space. These results open the way to further research on the subject and call into question the public policies in the field of mobility incentives. In France, since the years 2000, a flat allowance encouraging geographical mobility exists. However this allowance is only granted when the individual relocates more than 200 km away from his/her place of origin.[xv] While such allowances can be praised, the results obtained call for criticism on several points. First, this allowance should be a function of the worker's skills as the returns to migration are not the same among these young workers, and all the more so, as these returns are lower for the least skilled workers due to the narrow remuneration gaps. Moreover, this is all the more the case that three quarters of young migrants cover a distance of less than 200 km. Finally, the source of financing could differ according to the education level: national for the most skilled, regional (or by territory of arrival) for the least skilled.

REFERENCES

BRIANT A, COMBES P-P. and LAFOURCADE M. (2010) Dots to boxes: Do the size and shape of spatial units jeopardize economic geography estimations?, Journal of Urban Economics, vol. 67(3), 287-302.

CLARK, D.E. and COSGROVE J. (1991) Amenities versus Labor Market Opportunities : choosing the optimal distance to move., Journal of Regional Science, vol. 31, n°3, 311-328.

DA VANZO, J. (1983) Repeat Migration in the United States : Who Moves Back and Who Moves on ?, Review of Economics and Statistics, vol. 65 (4), 552-559.

DÉTANG-DESSENDRE, C. DRAPIER, C. and JAYET, H. (2004) The Impact of Migration on Wages: Empirical Evidence from French Youth, Journal of Regional Science, 44, 661-691.

FALARIS, M. (1988) Migration and wage of young men., Journal of Human Resources, vol. XXIII (4), 514-534.

GABRIEL, P. and SCHMITZ, S. (1995), Favorable Self-Selection and the Internal Migration of Young White Males in the United States., Journal of Human Resources, 30, 460-471.

GIBBS, R.M. (1994), The Information Effects of Origin on Migrants'Job Search Behavior, Journal of Regional Science, vol. 34(2), 163-178.

GORDON, I. and VICKERMAN, R. (1982) Opportunity, preference and constraint : an approach to the analysis of metropolitan migration, *Urban Studies,* vol. 19, 247-261.

GREENWOOD, M.J. (1997) Internal Migration in Developed Countries in Handbook of Population and Family Economics, Chapter 12, Vol. 1B, Elsevier Science, 647-720.

KEITH, K. and MCWILLIAMS, A. (1999) The Returns to Mobility and Job Search by Gender, Industrial and Labor Relations Review, vol. 52, 460-477.

KRIEG, R.G. (1997) Occupational change, employer change, internal migration, and earnings, *Regional Science and Urban Economics*, vol. 27 (1), pp. 1-15.

LEMISTRE, P. and MOREAU, N. (2009) Spatial mobility and returns of education: some evidence from a sample of French youth, Journal of Regional Science, vol.49, n°1, pp.149-176.

LONG, L. (1988) Migration and Residential Mobility in the United States. Russell Sage Foundation, New-York.

MADDALA, G. (1983) Limited-dependent and qualitative variables in econometrics, Cambridge University Press.

MAGRINI, M-B. (2006) La mobilité géographique des jeunes en insertion professionnelle, PhD Thesis, University of Toulouse.

NAKOSTEEN, R., WESTERLUND O. and ZIMMER, M. (2008) Migration and Self-Selection: Measured Earnings and Latent Characteristics, Journal of Regional Science, vol. 48(4), 769-788.

NAKOSTEEN, R. and ZIMMER, M. (1980) Migration and Income: The Question of Self-Selection, Southern Economic Journal, vol. 46, 840-851.

NELSON, F. and OLSEN, L. (1978) Specification and Estimation of a Simultaneous-Equation Model with Limited Dependent Variables, International-Economic-Review, vol.19, n°3, 695-709.

OLSEN, R.J. (1978) Note on the Uniqueness of the Maximum Likelihood Estimator for the Tobit Model, Econometrica, vol. 46(5), 1211-1215.

PUHANI, P. A. (2000) The Heckman Correction for Sample Selection and its critique, Journal of Economic Surveys, vol. 14, n°1, 53-68.

RAPHAËL, S. and RIKER, D. (1999) Geographic Mobility, Race, and Wage Differentials., Journal of Urban Economics, 45, 17-46.

SCHWARTZ, A. (1973) Interpreting the Effect of Distance on Migration, The Journal of Political Economy, vol. 81 (5), 1153-1169.

SJAASTAD, L. (1962) The Costs and Returns of Human Migration., Journal of Political Economy, 70, 80-93.

YANKOW, J. (2003) Migration, Job change, and wage growth: a new perspective on the pecuniary return to geographic mobility, Journal of Regional Science, 43(3), 486-516.

NOTES

[i] There are 341 EZ (or called "Employment Area") in Metropolitan France (excluding Corsica). The Employment Zones are geographic spaces defined within each of the 21 administrative Regions in Metropolitan France. The EZ unit is then smaller and more representative of the local labor markets than the administrative regions as underlined by BRIANT et al. (2010)

[ii] We may in particular invoke the argument according to which individuals' risk aversion will lead them to expect returns to migration that are all the greater, the greater the expenses incurred to migrate (GORDON and VICKERMAN 1982).

[iii] *"agents facing unknown higher migration costs have lower migration probabilities, and they are prepared to accept lower wages to stay at home. In other words, differences in migration costs should produce negative auto-selection effects for non-migrants"* (DÉTANG-DESSENDRE *et al.,* 2004, p. 671).

[iv] Note here that another bias can come from the sample selection of the youths occupying a job in 2001. But when integrating the Mill's ratio of sample selection (according to the Heckman method) for the different groups in the earnings function, the results are not modified. Therefore we have reported the estimations without it, as done by DETANG et al. (2004) for instance.

[v] *Céreq*: the French Center for Research on Education, Training and Employment.

[vi] Anyway, the EZ partition used is representative of the local labor markets. Therefore taking the location of residence or the location of job occupied in 2001 will do not significantly change the distance travelled for EZ move from the location occupied in 1998 to the one in 2001. Indeed, EZ are defined up to commuting distance inferior to 20km.

[vii] More precisely, the French *Baccalauréat*, designated "Bac", is the national diploma sanctioning the studies completed in the French national secondary school system (*Lycée* and *Collège)*, which corresponds to an American high school diploma + a variable amount of American university credits obtainable via "Advanced Placement" examinations.

[viii] The distance travelled between the EZ of studies in 1998 and the EZ of work in 2001 has been calculated "as the crow flies" between the centroids of the towns of departure and the arrival. In (x,y) space representing the geographic coordinates of points, the distance between two points A and B is: $d(A,B) = \sqrt{(x_b - x_a) + (y_b - y_a)}$.

[ix] The reader could refer to Briant, Combes and Lafourcade (2010) for a discussion on the impact of the size and the shape of areal unit on some economic migration effects.

[x] This control of the distance allows us, in a sense, to control for the "Modifiable Areal Unit Problem' (that is variation in the spatial units used for aggregation can cause variation in statistical results), as here choosing a smaller areal unit will count very small migrations that are out of concern in our analysis.

[xi] For a synthesis, see MAGRINI, 2006.

[xii] French National Institute of Statistics and Economic Studies (INSEE).

[xiii] Note here that the validity of instruments is significant for most of the variables employed in the migration equation that are not included in the earnings function, according to the Sargan test. When this test did turn out to be significant, the variable was nevertheless selected as an instrument if its effect was much more significant for migration than for salary. The choice of instruments according to the "inclusion-exclusion"

principle is always delicate. This is particularly true for certain variables such as the spouse's education level, the number of children, even some terms characterizing the youths' parents, which also seem to be significant in the gains function for certain groups. However, the combination of these significant terms differs from one group to another under consideration, which did not allow us to pass judgment on a notable significant effect of these variables for the set of all youths. Therefore, this weak level of influence, very unequally characterized from one group to another, led us to retain these variables in the selected equation in which they are clearly more significant. As for the gap variables of the territorial characteristics, they seem to be good instruments for all groups. This discussion demonstrates the difficulty in finding the "true" instrumental variables since the interactions among variables in a same process may be multiple, as PUHANI (2000) exposed.

[xiv] Annex 1 reports one estimation for all the variables from the T2SLS procedure in which the migration variable has been instrumented by both the individual's and territorial characteristics. The two other estimations are not reproduced because if the coefficient of distance varies greatly between each of the three estimates, the other parameters vary only marginally.

[xv] The "Professional Mobility" allowance makes it thus possible to benefit from a tax credit of 1,500 €.

TABLES

Table 1. Distances travelled by young people during migration between the end of their studies and three years later

	Mean km	Median km	Under 20 km	Between 20 and 50 km	Between 50 and 100 km	Between 100 and 300 km	Over 300km
Change of EZ							
Bac+5	220	150	15%	15%	10%	26%	34%
Bac+2 to +4	170	80	14%	24%	17%	24%	21%
≤ Bac	145	45	25%	27%	13%	16%	19%
All the above	170	70	20%	24%	14%	21%	21%
Change of Region							
Bac+5	350	330	0,1%	1%	4%	38%	56%
Bac+2 to +4	310	275	2%	4%	8%	40%	46%
≤ Bac	305	275	6%	7%	9%	31%	47%
All the above	315	290	3%	5%	7%	37%	48%

Note: percentages are a function of the total number of the group of migrant workers considered. EZ: Employment Zone.

Table 2. Reduced-Form Equation for Distance Travelled

Education level		Whole sample			Bac+5			Bac+2, 3 or 4			≤ Bac		
Intercept		2.895	***	(0.368)	8.116	***	(0.661)	3.088	***	(0.505)	-4.169	***	(0.578)
INDIVIDUALS' CHARACTERISTICS													
Women		-0.685	***	(0.071)	-0.814	***	(0.175)	-0.694	***	(0.106)	-0.807	***	(0.119)
Education level	Unskilled	-4.859	***	(0.156)							-1.446	***	(0.149)
	First level of professional certification (Cap, Bep)	-4.327	***	(0.138)							-1.038	***	(0.122)
	Bac	-3.046	***	(0.113)							ref.		
	Bac+2	-1.532	***	(0.103)				-0.910	***	(0.100)			
	Bac+3	-1.029	***	(0.145)				-0.429	***	(0.136)			
	Bac+4	-0.563	***	(0.116)				ref.					
	Bac+5	ref.											
Age in 1998		-0.098	***	(0.014)	-0.267	***	(0.025)	-0.115	***	(0.020)	0.041		(0.026)
Education level of the husband		0.165	***	(0.021)	0.009		(0.040)	0.130	***	(0.026)	0.410	***	(0.050)
Education level of the wife		0.100	***	(0.021)	-0.030		(0.035)	0.079	***	(0.030)	0.226	***	(0.046)
Number of children		-0.783	***	(0.071)	-0.501	***	(0.109)	-0.706	***	(0.106)	-0.756	***	(0.144)
Father's profession	Farmer	0.443	***	(0.138)	0.954	***	(0.345)	0.478	***	(0.192)	0.099		(0.242)
	Corporate managers	0.255	***	(0.099)	0.172		(0.244)	0.407	***	(0.143)	0.040		(0.167)
	Professionals	0.478	***	(0.085)	0.065		(0.179)	0.219	*	(0.118)	1.227	***	(0.172)
	Technicians and similar professionals	0.401	***	(0.105)	0.317		(0.248)	0.206		(0.144)	0.505	***	(0.191)
	Clerks	0.375	***	(0.074)	0.043		(0.217)	0.211	*	(0.113)	0.565	***	(0.116)
	Workers and elementary occupations	ref.			ref.			ref.			ref.		
	Unknown	1.296	*	(0.716)	1.863		(1.870)	-0.072		(1.786)	1.514		(0.968)
Father is unemployed 1998		-0.603	***	(0.180)	0.163		(0.472)	-0.766	***	(0.291)	-0.729	***	(0.276)
TERRITORIAL CHARACTERISTICS													
Rural area at the end of schooling		1.310	***	(0.078)	1.875	***	(0.271)	1.231	***	(0.125)	1.427	***	(0.117)
Population density gap (between EZ 98 and EZ 2001)*1000		0.174	***	(0.000)	0.103	***	(0.000)	0.182	***	(0.000)	0.237	***	(0.000)
Unemployment rate gap (between EZ 98 and EZ 2001)		-0.193	***	(0.012)	-0.249	***	(0.023)	-0.210	***	(0.017)	-0.129	***	(0.024)
Share of students gap (between EZ 98 and EZ 2001)		-7.588	***	(0.776)	-20.652	***	(1.605)	-12.687	***	(1.049)	5.196	***	(1.471)

*Notes: Asymptotic standard errors in parentheses. Significance levels of 10%, 5% and 1% are denoted *, ** and *** respectively.*

Table 3. Returns to Migration with Distances Travelled Included in the Estimation

	Whole sample			Bac+5			Bac+2, 3 or 4			≤ Bac		
	OLS	T2SLS-1	T2SLS-2	OLS	T2SLS-1	T2SLS-2	OLS	T2SLS-1	T2SLS-2	OLS	T2SLS-1	T2SLS-2
Variables in migration equation *Ind : Individual's Characteristics* *Terr : Territorial's Characteristics*		*Ind.*	*Ind.+Terr.*		*Ind.*	*Ind.+Terr.*		*Ind.*	*Ind.+Terr.*		*Ind.*	*Ind.+Terr.*
Estimated coefficients from the log wage equation												
ln (distance EZ98 - EZ2001)	0.0071	0.0022	0.0018	0.0032	-0.0779	-0.0068	0.009	0.0113	0.0071	0.0066	0.0093	0.0056
	(0.0005)	(0.0024)	(0.0012)	(0.0015)	(0.0093)	(0.0027)	(0.0008)	(0.0045)	(0.0019)	(0.0008)	(0.0022)	(0.0015)
LAMDA		0.00016	0.00017		0.0799	0.0097		-0.0075	-0.0022		-0.0076	-0.0035
		(0.0016)	(0.0001)		(0.0093)	(0.0029)		(0.0042)	(0.0014)		(0.0022)	(0.0015)
Corresponding wage returns in % per distance (km)												
50 km	2.5%	0.8%	0.6%	1.1%	-23.3%	-2.3%	3.1%	3.9%	2.4%	2.3%	3.2%	1.9%
100 km	3.2%	1.0%	0.8%	1.4%	-28.9%	-2.9%	4.0%	5.1%	3.1%	2.9%	4.1%	2.5%
300 km	4.1%	1.3%	1.0%	1.8%	-35.5%	-3.8%	5.2%	6.6%	4.1%	3.8%	5.4%	3.2%
600 km	4.6%	1.4%	1.1%	2.0%	-39.1%	-4.2%	5.9%	7.5%	4.6%	4.3%	6.1%	3.6%
900 km	4.9%	1.5%	1.2%	2.2%	-41.1%	-4.5%	6.3%	8.0%	4.9%	4.6%	6.5%	3.8%
Returns for the median distance	3.3%	1.0%	0.8%	1.7%	-33.6%	-3.5%	4.1%	5.2%	3.2%	2.8%	4.0%	2.4%
Median distance		115 km			210 km			110 km			90 km	
R^2	*61%*			*45%*			*45%*			*46%*		

Note: The log wage equation variables are summarized in tables A. LAMBDA is the Maddala endogeneity test: correlation between Tobit error term for distance ϕ (equation 8) and Log wage equation error ε (equation 7).

Annexe 1. Log Wage Equation with Tobit Double Least Squares T2SLS-2 (from Migration Equation with Individual's and territorial characteristics)

	Whole sample		Bac+5		Bac+2, 3 or 4		≤ Bac	
Intercept	7.250***	(0.018)	7.142***	(0.056)	7.039***	(0.032)	6.886***	(0.021)
Education level								
Unskilled	-0.413***	(0.009)					-0.045***	(0.005)
First level of professional certification (Cap, Bep)	-0.397***	(0.008)					-0.021***	(0.004)
Bac	-0.379***	(0.006)					ref.	
Bac+2	-0.258***	(0.005)			-0.038***	(0.005)		
Bac+3	-0.306***	(0.007)			-0.081***	(0.007)		
Bac+4	-0.213***	(0.006)			ref.			
Bac+5	ref.							
Women	-0.074***	(0.003)	-0.078***	(0.008)	-0.060***	(0.005)	-0.079***	(0.004)
Age in 1998	0.016***	(0.001)	0.023***	(0.002)	0.016***	(0.001)	0.014***	(0.001)
Number of months unemployed	-0.006***	(0.000)	-0.016***	(0.001)	-0.010***	(0.000)	-0.004***	(0.000)
Area at end of schooling								
Urban	ref.		ref.		ref.		ref.	
Suburban area	-0.022***	(0.004)	-0.035*	(0.019)	-0.028***	(0.008)	-0.018***	(0.005)
"Multi-polar" area	-0.015**	(0.007)	0.032	(0.035)	-0.028**	(0.013)	-0.015*	(0.008)
Rural area	-0.022***	(0.004)	0.012	(0.017)	-0.040***	(0.007)	-0.024***	(0.005)
Region								
Paris	ref.		ref.		ref.		ref.	
Parisian region	-0.107***	(0.004)	-0.095***	(0.013)	-0.132***	(0.007)	-0.078***	(0.005)
North	-0.109***	(0.006)	-0.137***	(0.018)	-0.122***	(0.010)	-0.083***	(0.008)
East	-0.077***	(0.005)	-0.120***	(0.016)	-0.098***	(0.008)	-0.040***	(0.006)
West	-0.116***	(0.004)	-0.111***	(0.014)	-0.148***	(0.007)	-0.081***	(0.006)
Southwest	-0.138***	(0.005)	-0.126***	(0.015)	-0.169***	(0.008)	-0.108***	(0.006)
Centre-East	-0.100***	(0.004)	-0.108***	(0.013)	-0.121***	(0.008)	-0.066***	(0.006)
Mediterranean	-0.120***	(0.005)	-0.128***	(0.013)	-0.145***	(0.008)	-0.084***	(0.006)
ln (distance EZ 98 - EZ 01)	0.002	(0.001)	-0.007**	(0.003)	0.007***	(0.002)	0.006***	(0.001)

*Notes: Asymptotic standard errors in parentheses. Other regressors are sectors, functions, type of employment contract, monthly working hours. Significance levels of 10%, 5% and 1% are denoted *, ** and *** respectively.*